Features

- Super high-speed sampling cycle
  (10 times faster compared to existing models)
  : 50 ms sampling cycle and ±0.3% display accuracy
- Improved visibility with wide display and high luminance LED
- Easy check control output MV with Bar graph
- High performance control with heating/cooling control and automatic/manual control modes
- PC parameter setting
  (via USB and RS485 communication)
  : Integrated device management program (DAQMaster) supported

  ※ Communication converter, sold separately:
  SCM-WF48 (Wi-Fi to RS485, USB converter)
  SCM-US48I (USB to RS485 converter),
  SCM-38I (RS232C to RS485 converter),
  SCM-US (USB to Serial converter),
- Selectable SSR output or current output
- Heater disconnection alarm (CT input) function
  ※ CT, sold separately: CSTC-E80LN, CSTC-E200LN
- Multi-SV (up to 4) setting (selectable by digital input terminal)
- Space saving with compact design: downsized by 38% depth-based (panel rear length: 60 mm)
- Terminal cover, sold separately: R□A-COVER
- Multi-input/Multi-range

Please read "Caution for your safety" in operation manual before using this unit.

Manual

- For more information and instructions, refer to the user manual and the user manual for communication.
  Visit our web site (www.autonics.com) to download the manuals.
- The user manual includes product specifications, functions, and operations.
- The user manual for communication includes information about Modbus RTU protocol, and Modbus mapping table.

Integrated device management program(DAQMaster)

DAQMaster is the integrated device management program to set parameters and manage monitoring data and user group, parameter mask which are the dedicated function of KPN.

Visit our website (www.autonics.com) to download user manual and integrated device management program.

< Computer specification for using software >

Item	Minimum requirements
System	IBM PC compatible computer with Intel Pentium III or above
Operating system	Microsoft Windows 98/NT/XP/Vista/7
Memory	256MB or more
Hard disk	More than 1GB of free hard disk space
VGA	1024×768 or higher resolution display
Others	RS-232 serial port(9-pin), USB port

< DAQMaster screen >

Ordering information

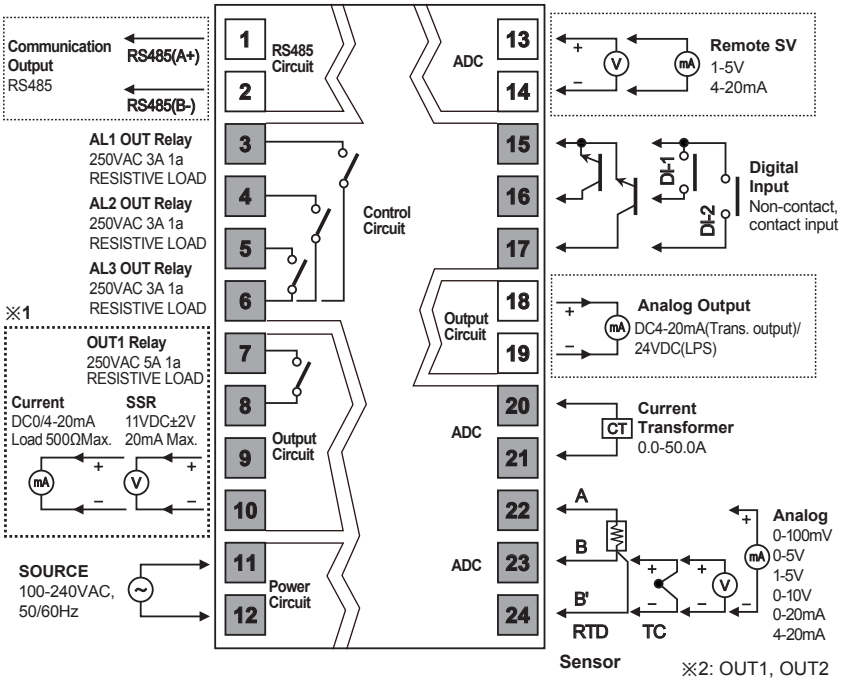
KPN5 5 0 0 – 0 0 0

Power supply	0		100-240 VAC 50/60 Hz
Option input/output	0		None
	3		Transmission output + Remote SV
Option communication output	0		None
	2		RS485
Control output※1	1 output type	0	Relay, Current, SSR drive voltage selection output
	2 output type	1	OUT1: Current, SSR drive voltage selection output OUT2: Current, SSR drive voltage selection output
		3	OUT1: Current, SSR drive voltage selection output OUT2: Relay output
		7	OUT1: Relay output OUT2: Current, SSR drive voltage selection output
		9	OUT1: Relay output OUT2: Relay output
The number of control outputs	0		1 output type (Heating or Cooling type)
	1		2 output type (Heating&Cooling type)
Size	2		DIN W96×H48 mm
	3		DIN W48×H96 mm
	5		DIN W96×H96 mm
Item	KPN5		Temperature / Process Controller

※1: The 1 output type is heating or cooling output type and the 2 output type is heating & cooling output type.
The 1 output type is able to use only one output among relay, current, SSR drive voltage outputs.
OUT1 of the 2 output type is fixed as heating output and OUT2 of the 2 output type is fixed as cooling output.
If you select the SSR drive voltage or current output model, you can select the appropriate control output.

Connections

◎ **KPN5□00**

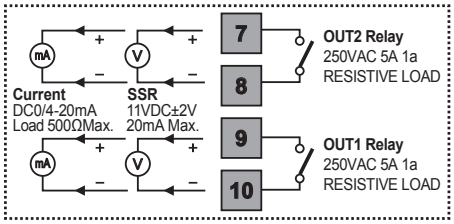


※1:Set relay output [rLY], current [CUr], or SSR drive voltage output [SSr] at OUT1 control output [oUt1] in parameter 3 group.

※ Standard model has shaded terminals only.
⋯⋯ is option specification.

◎ **KPN5□1□**

※2



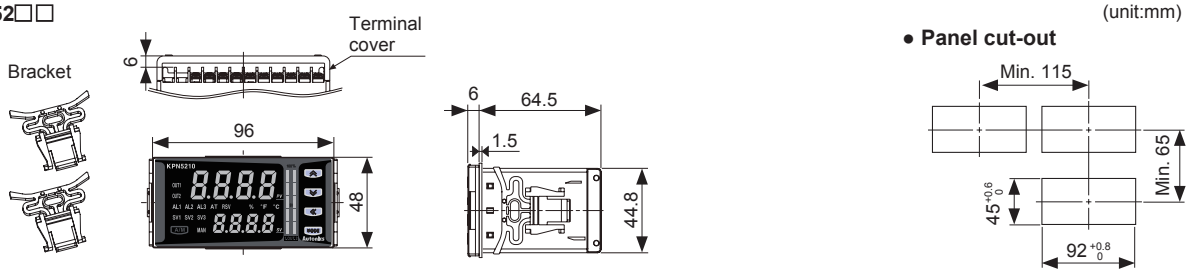
※2: OUT1, OUT2

Model	OUT1 control output	OUT2 control output
KPN5□11	Current, SSR drive voltage selection output	Current, SSR drive voltage selection output
KPN5□13	Current, SSR drive voltage selection output	Relay output
KPN5□17	Relay output	Current, SSR drive voltage selection output
KPN5□19	Relay output	Relay output

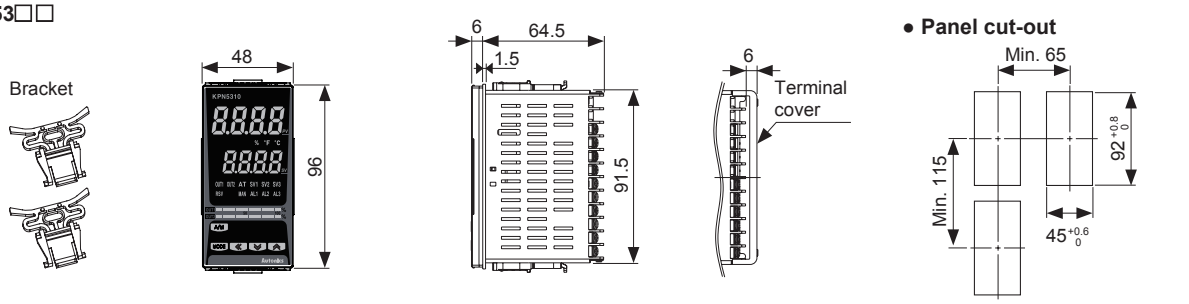
Dimensions

(unit:mm)

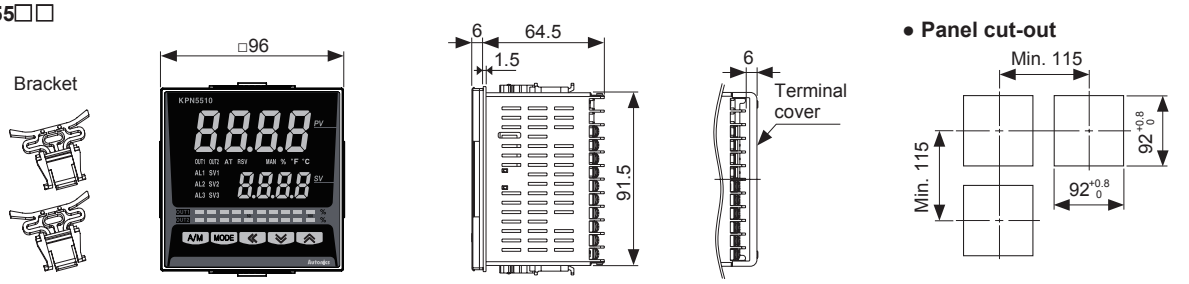
◎ **KPN52□□**



◎ **KPN53□□**

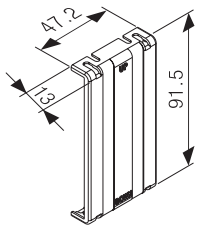


◎ **KPN55□□**

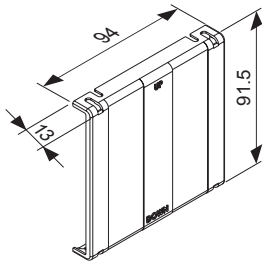


◎ **Terminal cover (sold separately)**

● **RHA-COVER (48×96 mm size)**



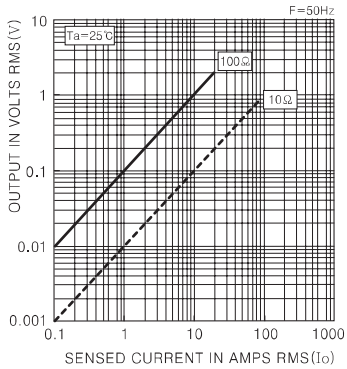
● **RLA-COVER (96×96 mm size)**



◎ **Current transformer (CT, sold separately)**

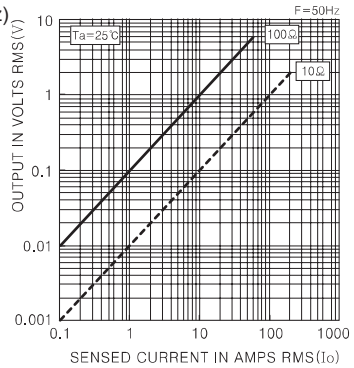
● **CSTC-E80LN**

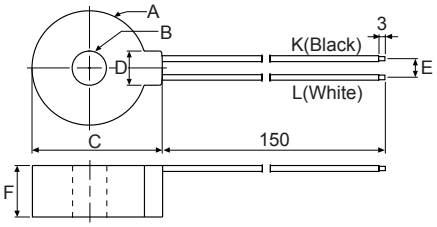
Max. load current: 80A (50/60Hz)
※Max. load current for KPN Series is 50A.
Current ratio: 1/1000
Wire round resistance: 31Ω±10%



● **CSTC-E200LN**

Max. load current: 200A (50/60Hz)
※Max. load current for KPN Series is 50A.
Current ratio: 1/1000
Wire round resistance: 20Ω±10%





(unit:mm)

Model	A	B	C	D	E	F
CSTC-E80N	Ø23.3	Ø7	26.5	7	3.8	10.5
CSTC-E200N	Ø37.1	Ø13	40.8	10	4.5	13.5

※ When using a CT, do not apply primary current when opening CT output. Or high voltage occurs at CT output.

Sold Separately

◎ **Communication converter**

- **SCM-WF48** (available soon)
  (Wi-Fi to RS485/USB communication converter)

- **SCM-US48I**
  (USB to RS485 converter)

- **SCM-38I**
  (RS232C to RS485 converter)

- **SCM-US**
  (USB to Serial converter)

Input type and range

Input type		Dot	Parameter	Input range (℃)	Input range (℉)
Thermocouple	K(CA)	1	tC.H1	-200 to 1350	-328 to 2463
		0.1	tC.H2	-199.9 to 999.9	-199.9 to 999.9
	J(IC)	1	tC.J1	-200 to 800	-328 to 1472
		0.1	tC.J2	-199.9 to 800.0	-199.9 to 999.9
	E(CR)	1	tC.E1	-200 to 800	-328 to 1472
		0.1	tC.E2	-199.9 to 800.0	-199.9 to 999.9
	T(CC)	1	tC.t1	-200 to 400	-328 to 752
		0.1	tC.t2	-199.9 to 400.0	-199.9 to 752.0
	B(PR)	1	tC-b	0 to 1800	32 to 3272
	R(PR)	1	tC-r	0 to 1750	32 to 3182
	S(PR)	1	tC-S	0 to 1750	32 to 3182
	N(NN)	1	tC-n	-200 to 1300	-328 to 2372
	C(TT)※1	1	tC-C	0 to 2300	32 to 4172
	G(TT)※2	1	tC-G	0 to 2300	32 to 4172
	L(IC)	1	tC.L1	-200 to 900	-328 to 1652
		0.1	tC.L2	-199.9 to 900.0	-199.9 to 999.9
	U(CC)	1	tC.U1	-200 to 400	-328 to 752
		0.1	tC.U2	-199.9 to 400.0	-199.9 to 752.0
RTD	Platinel II	1	tC-P	0 to 1390	32 to 2534
	Cu50Ω	0.1	Cu.50	-199.9 to 200.0	-199.9 to 392.0
	Cu100Ω	0.1	Cu.10	-199.9 to 200.0	-199.9 to 392.0
	JPt100Ω	1	JPt.1	-200 to 650	-328 to 1202
		0.1	JPt.2	-199.9 to 650.0	-199.9 to 999.9
	DPt50Ω	0.1	dPt.5	-199.9 to 650.0	-199.9 to 999.9
	DPt100Ω	1	dPt.1	-200 to 650	-328 to 1202
		0.1	dPt.2	-199.9 to 650.0	-199.9 to 999.9
	Nickel120Ω	1	nI.12	-80 to 200	-112 to 392
Analog	0-10 V		A-u1	-1999 to 9999 (display range depends on the decimal point position)	
	0-5 V		A-u2		
	1-5 V		A-u3		
	0-100 mV		A.nu1		
	0-20 mA		A.nA1		
	4-20 mA		A.nA2		

※ 1: C(TT) : Same as existing W5(TT) type sensor.

※ 2: G(TT) : Sane as existing W(TT) type sensor.

Specifications

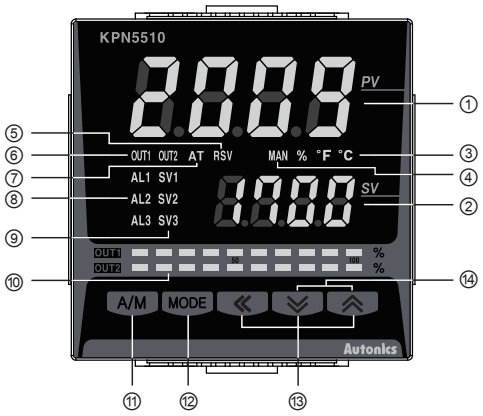
Series		KPN52□□	KPN53□□	KPN55□□
Power supply		100-240 VAC 50/60 Hz		
Allowable voltage range		90 to 110% of rated voltage		
Power consumption		Max. 15 VA		
Display method		7Segment(red, green), control Bar graph: red, green		
Character size	PV(W×H)	8.5×17.0 mm	7.0×14.6 mm	11.0×22.0 mm
	SV(W×H)	6.0×12.0 mm	6.0×12.0 mm	6.0×12.0 mm
Input type	RTD	JPt100Ω, DPt100Ω, DPt50Ω, Cu100Ω, Cu50Ω, Nikel120Ω(6 types)		
	TC	K, J, E, T, L, N, U, R, S, B, C, G, PLII(13 types)		
	Analog	・Voltage: 0-100 mV, 0-5 V, 1-5 V, 0-10 V(4 types) ・Current: 0-20 mA, 4-20 mA(2 types)		
Display accuracy	RTD	・At room temperature (23±5 ℃): (PV ±0.3% or ±1 ℃, select the higher one) ±1digit ※1 ・Out of room temperature range: (PV ±0.5% or ±2 ℃, select the higher one) ±1digit		
	TC			
	Analog	At room temperature (23±5 ℃): ±0.3% F.S.±1digit, Out of room temperature range: ±0.5% F.S.±1digit		
	CT input	±5% F.S.±1digit		
Control output	Relay	OUT1, OUT2 : 250 VAC 5 A 1 a		
	SSR	Max. 11 VDC±2 V 20 mA		
	Current	0-20 mA or 4-20 mA selectable (max. load 500 Ω)		
Alarm output	Relay	AL1, AL2, AL3 Relay contact capacity 250 VAC 3 A 1 a		
Option output	Transmission	4-20 mA (Load max. 600 Ω, output accuracy: ±0.3% F.S.±1digit)		
	Communication	RS485 communication output (Modbus RTU method)		
Option input	CT	0.0-50.0 A(primary heater current value measuring range) ※CT ratio is 1/1000		
	Remote SV	1-5 VDC or 4-20 mA(current input: using external resistance 250 Ω)		
	Digital input	・Contact input: Max. 2 kΩ in ON, Min. 90 kΩ in ON ・Non-contact input: Residual voltage max. 1.0 V in ON, leakage current max. 0.1 mA in OFF		
Control type	Heating, Cooling	ON/OFF control, P, PI, PD, PID control		
	Heating&Cooling			
Hysteresis		・Thermocouple/RTD: 1 to 100 ℃/℉(0.1 to 100.0 ℃/℉) variable ・Analog: 1 to 100 digit		
Proportional band (P)		0.1 to 999.9 ℃(0.1 to 999.9%)		
Integral time(I)		0 to 9999 sec.		
Derivative time (D)		0 to 9999 sec.		
Control period(T)		0.1 to 120.0 sec.(relay output, SSR drive voltage output only)		
Manual reset value		0.0 to 100.0%		
Sampling period		50 ms		
Dielectric strength		2000 VAC 50/60 Hz for 1 min. (between input terminal and power source terminal)		
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz (for 1 min.) in each X, Y, Z direction for 2 hours		
Relay life cycle	Mechanical	Over 10,000,000 operations		
	Electrical	Over 100,000 operations (250 VAC 3 A resistance load)		
Insulation resistance		Over 100 MΩ at 500 VDC megger)		
Noise resistance		Square shaped noise by noise simulator (pulse width 1μs) ±2 kV R-phase, S-phase		
Memory retention		Approx. 10 years (when using non-volatile semiconductor memory type)		
Environment	Ambient temperature	-10 to 50 ℃, storage: -20 to 60 ℃		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Protection		IP65(front part)		
Insulation type		Double insulation or reinforced insulation (mark: ⊡, dielectric strength between the measuring input part and the power part: 1kV)		
Unit weight		Approx. 160 g		Approx. 220 g

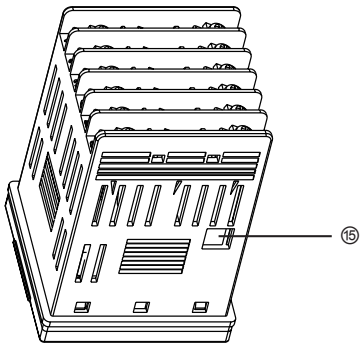
※1. ◎ At room temperature (23 ℃±5 ℃)
- ・TC K, J, T, N, E type, below -100 ℃ / L, U, PLII, RTD Cu50, DPt50: (PV ±0.3% or ±2 ℃, select the higher one) ±1digit
- ・TC C, G and R, S type, below 200 ℃: (PV ±0.3% or ±3 ℃, select the higher one) ±1digit
- ・TC B type, below 400 ℃, there is no accuracy standards.

◎ Out of room temperature range
- ・RTD Cu50, DPt50: (PV 0.5% or ±3 ℃, select the higher one) ±1digit
- ・RTD R, S, B, C, G: (PV ±0.5% or ±10 ℃, select the higher one) ±1digit
- ・Other sensors: Below -100 ℃, within ±5 ℃

※ Environment resistance is rated at no freezing or condensation.

Part descriptions





① Measured value(PV) display part
- RUN mode: Displays currently measured value (PV).
- Set mode: Displays the parameters.

② Set value (SV) display part
- RUN mode: Displays the set value (SV).
- Set mode: Displays the set value of the parameter.

③ Unit(℃/℉/%) indicator: Displays the unit set at display unit [d.Unt] in parameter 3 group.

④ Manual control indicator : Turns ON during manual controlling.

⑤ Remote SV control indicator : Turns ON during remote SV controlling.

⑥ Control output (OUT1, OUT2) indicator: Turns ON when the control output is ON.

※Using current output, in case that for manual control MV is 0.0%, the control output indicator turns OFF but the other cases it turns ON always. In case that for auto control MV is over 3.0%, it turns ON and the MV is below 2.0%, it turns OFF.

⑦ Auto tuning indicator: Flashes by 1 sec. when executing auto tuning.

⑧ Alarm output (AL1, AL2, AL3) indicator: Turns ON when the alarm output is ON.

⑨ Multi SV indicator: The SV 1 to 3 indicator turns ON when using multi SV function.

⑩ Bar graph for control output: Displays control output MV as bar graph.

KPN5□00 as 1 output type has one bar graph (OUT1), and the KPN5□1□ as 2 output type has two bar graphs (OUT1, OUT2).

⑪ **A/M** key: Used when switching auto control to manual control.

⑫ **MODE** key: Used when entering parameter setting group, returning to RUN mode, moving parameter, saving the set value.

⑬ ≪, ≫, ∧ key: Used when entering the set value changing mode and moving or changing up/down digit.

⑭ Digital input key : When pressing the ≫ + ∧ keys for 3 sec. at the same time, it operates the function (RUN/STOP, alarm clear, auto-tuning) set at digital input key [di -t] in parameter 5 group.

⑮ PC loader port: It is the PC loader port for serial communication to set and monitor parameters by PC. Use this port for connection SCM-US (USB to serial convertor).

※ Display part is different by options.

SV settings

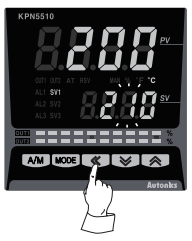
You can set the temperature to control with the ≪ , ≫ , ∧ keys.

Set range is within SV low-limit value [L-Su] to SV high-limit value [H-Su].

※ Ex) In case of changing set temperature from 210 ℃ to 250 ℃

①

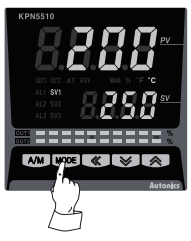
Press any key among the ≪, ≫, ∧ in RUN mode to enter into SV setting mode. Last digit (10^0 digit) on SV display part flashes.

② 

Press the ≪ key to move digit. ($10^0 \rightarrow 10^1 \rightarrow 10^2 \rightarrow 10^3 \rightarrow 10^0$)

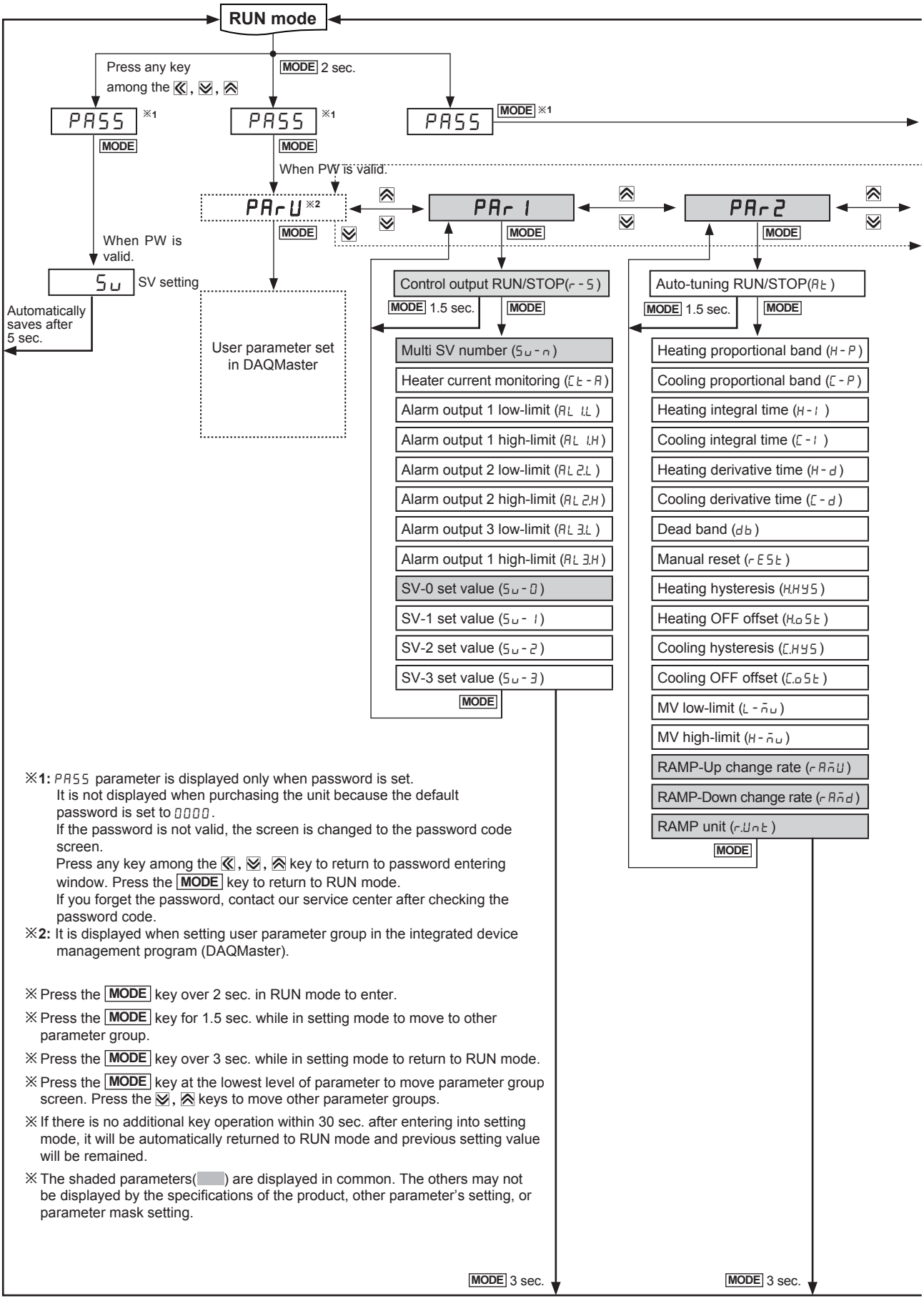
③

Press the ≫ or ∧ key to raise or lower the setting value. (1 → 5)

④ 

Press the **MODE** key to save the setting value. If there is no additional key operations in 3 sec., the changed SV is automatically saved.

Parameter groups



※**1:** PASS parameter is displayed only when password is set.
It is not displayed when purchasing the unit because the default password is set to 0000.
If the password is not valid, the screen is changed to the password code screen.
Press any key among the ≪, ≫, ≪ key to return to password entering window. Press the **MODE** key to return to RUN mode.
If you forget the password, contact our service center after checking the password code.

※**2:** It is displayed when setting user parameter group in the integrated device management program (DAQMaster).

※ Press the **MODE** key over 2 sec. in RUN mode to enter.

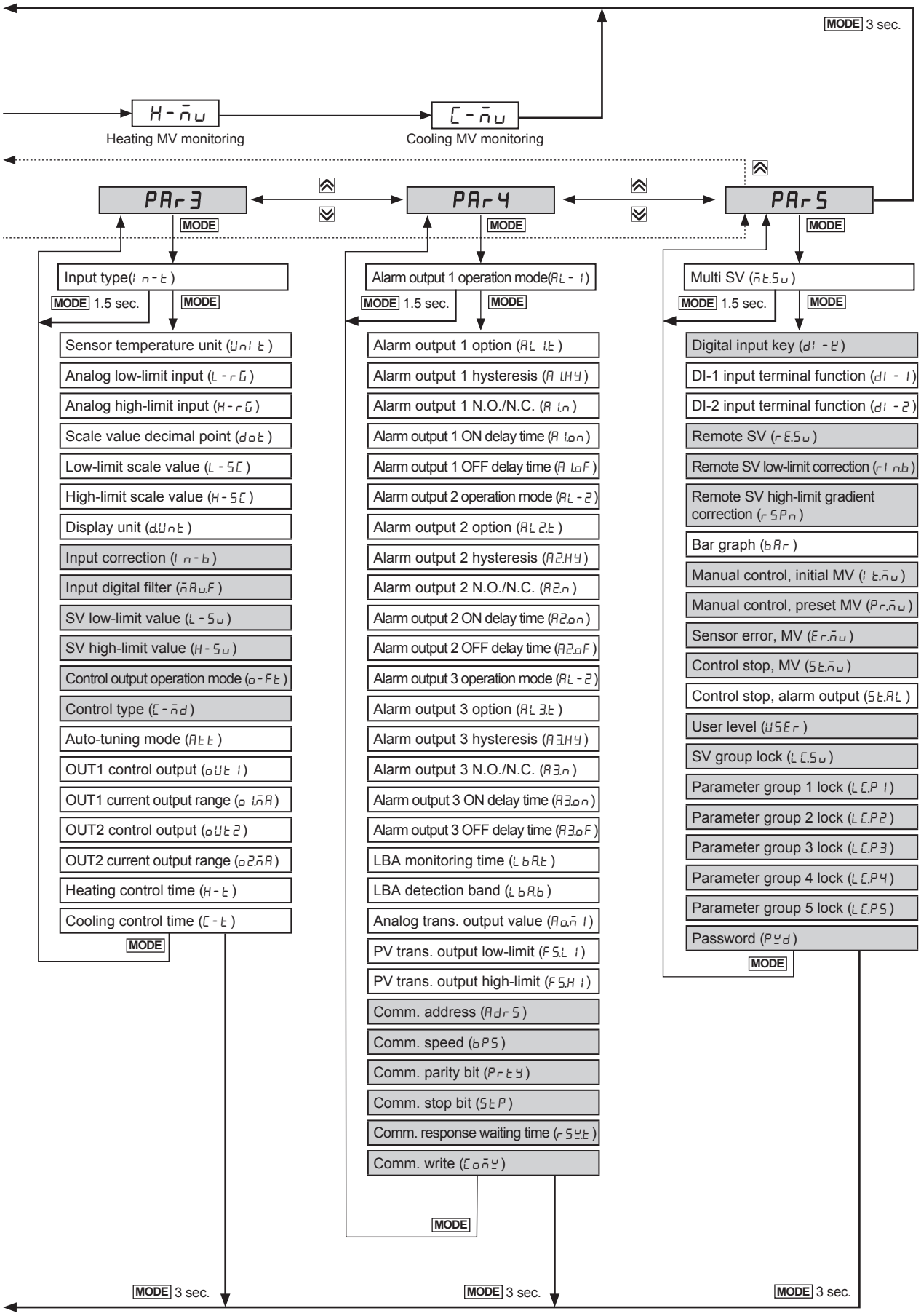
※ Press the **MODE** key for 1.5 sec. while in setting mode to move to other parameter group.

※ Press the **MODE** key over 3 sec. while in setting mode to return to RUN mode.

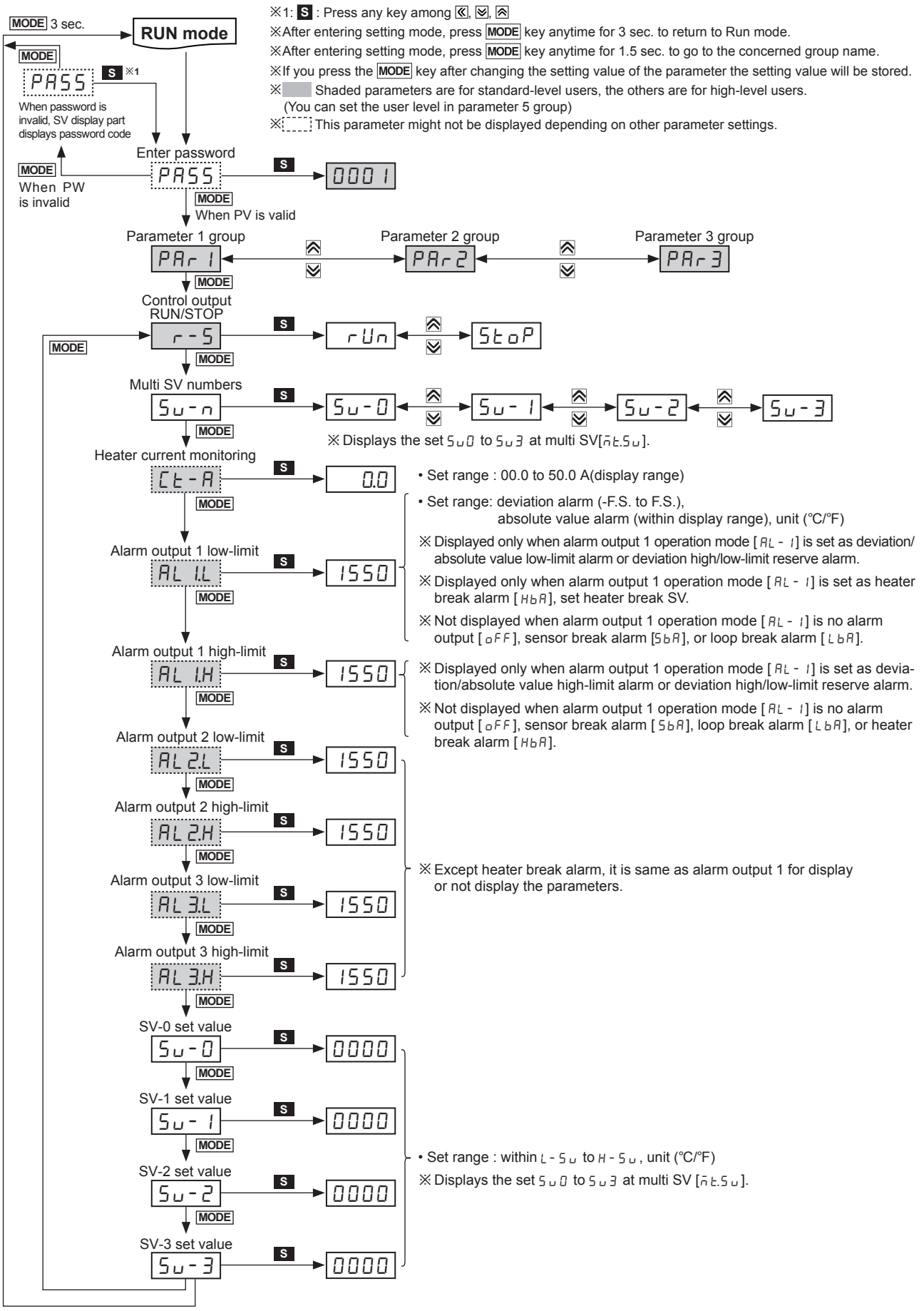
※ Press the **MODE** key at the lowest level of parameter to move parameter group screen. Press the ≫, ≪ keys to move other parameter groups.

※ If there is no additional key operation within 30 sec. after entering into setting mode, it will be automatically returned to RUN mode and previous setting value will be remained.

※ The shaded parameters( ) are displayed in common. The others may not be displayed by the specifications of the product, other parameter's setting, or parameter mask setting.

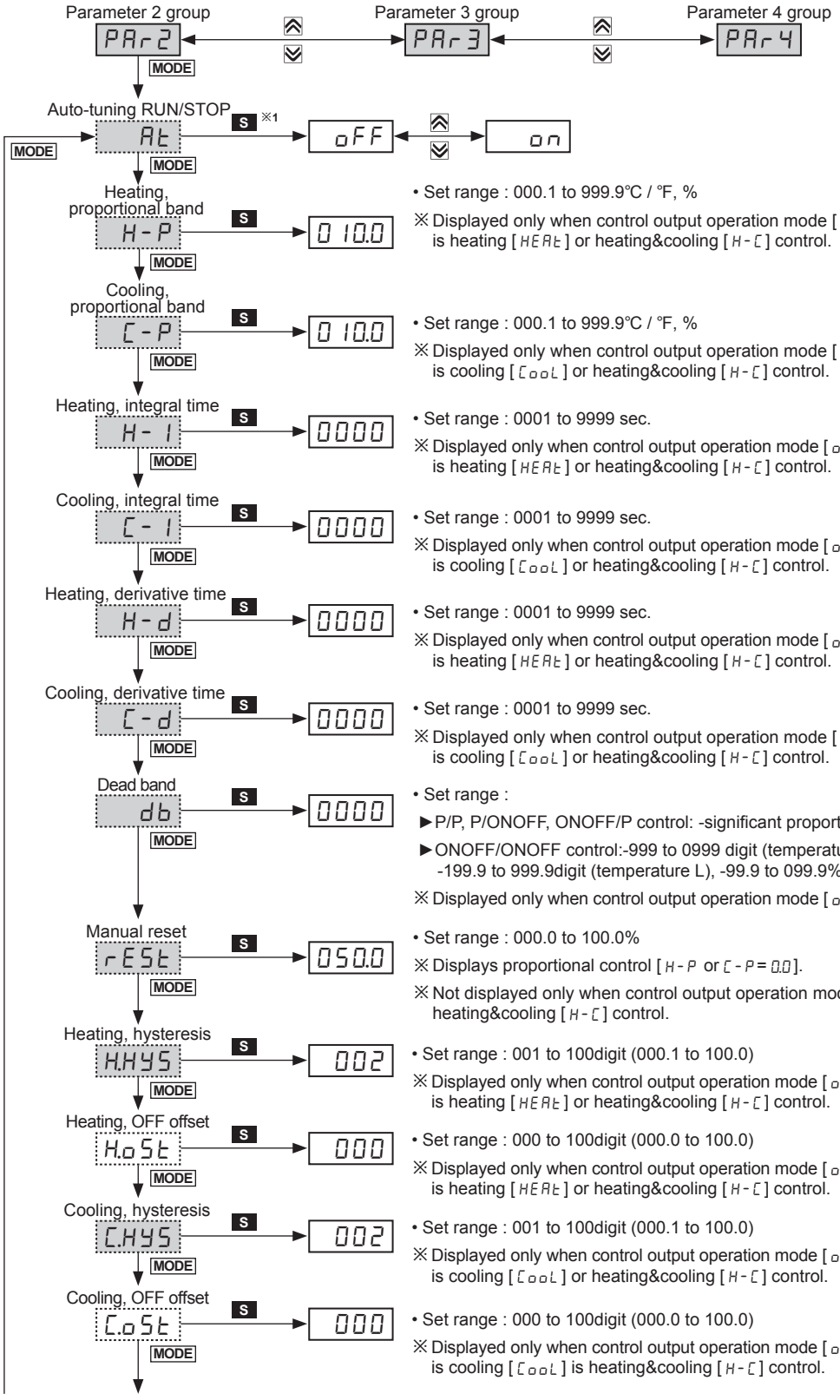

MODE 3 sec.
H-ou
Heating MV monitoring
C-ou
Cooling MV monitoring
PAr3
PAr4
PAr5
MODE
Input type(in-t)
MODE 1.5 sec.
Sensor temperature unit (Unit)
Analog low-limit input (L-rG)
Analog high-limit input (H-rG)
Scale value decimal point (dot)
Low-limit scale value (L-SC)
High-limit scale value (H-SC)
Display unit (d.Unt)
Input correction (in-b)
Input digital filter (inFu.F)
SV low-limit value (L-Su)
SV high-limit value (H-Su)
Control output operation mode (o-Ft)
Control type (C-md)
Auto-tuning mode (AtT)
OUT1 control output (oUt1)
OUT1 current output range (o1.nA)
OUT2 control output (oUt2)
OUT2 current output range (o2.nA)
Heating control time (H-t)
Cooling control time (C-t)
Alarm output 1 operation mode(AL-1)
Alarm output 1 option (AL1t)
Alarm output 1 hysteresis (A1.HY)
Alarm output 1 N.O./N.C. (A1.n)
Alarm output 1 ON delay time (A1.on)
Alarm output 1 OFF delay time (A1.oF)
Alarm output 2 operation mode (AL-2)
Alarm output 2 option (AL2t)
Alarm output 2 hysteresis (A2.HY)
Alarm output 2 N.O./N.C. (A2.n)
Alarm output 2 ON delay time (A2.on)
Alarm output 2 OFF delay time (A2.oF)
Alarm output 3 operation mode (AL-3)
Alarm output 3 option (AL3t)
Alarm output 3 hysteresis (A3.HY)
Alarm output 3 N.O./N.C. (A3.n)
Alarm output 3 ON delay time (A3.on)
Alarm output 3 OFF delay time (A3.oF)
LBA monitoring time (LbAt)
LBA detection band (LbAb)
Analog trans. output value (Ao.n1)
PV trans. output low-limit (FS.L1)
PV trans. output high-limit (FS.H1)
Comm. address (Adr S)
Comm. speed (bPS)
Comm. parity bit (PrtY)
Comm. stop bit (StP)
Comm. response waiting time (rSUt)
Comm. write (Conf)
Multi SV (mt.Su)
Digital input key (di-K)
DI-1 input terminal function (di-1)
DI-2 input terminal function (di-2)
Remote SV (rE.Su)
Remote SV low-limit correction (rlnb)
Remote SV high-limit gradient correction (rSPn)
Bar graph (bAr)
Manual control, initial MV (itou)
Manual control, preset MV (Pr.ou)
Sensor error, MV (Er.ou)
Control stop, MV (StoU)
Control stop, alarm output (StAL)
User level (USEr)
SV group lock (LC.Su)
Parameter group 1 lock (LC.P1)
Parameter group 2 lock (LC.P2)
Parameter group 3 lock (LC.P3)
Parameter group 4 lock (LC.P4)
Parameter group 5 lock (LC.P5)
Password (PWd)
MODE 3 sec.
MODE 3 sec.
MODE 3 sec.

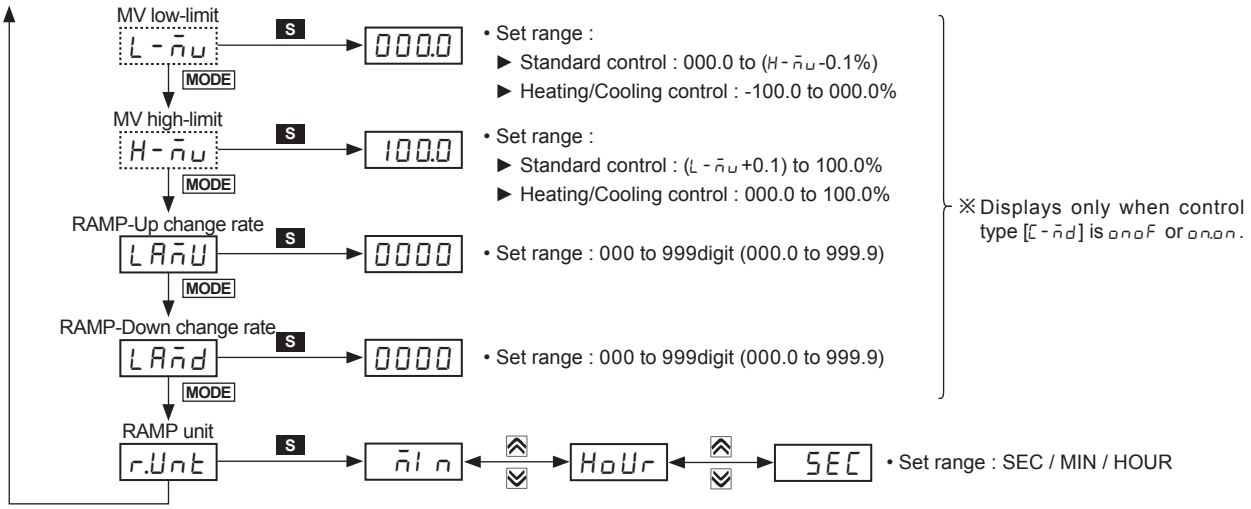
Parameter 1 group



Parameter 2 group

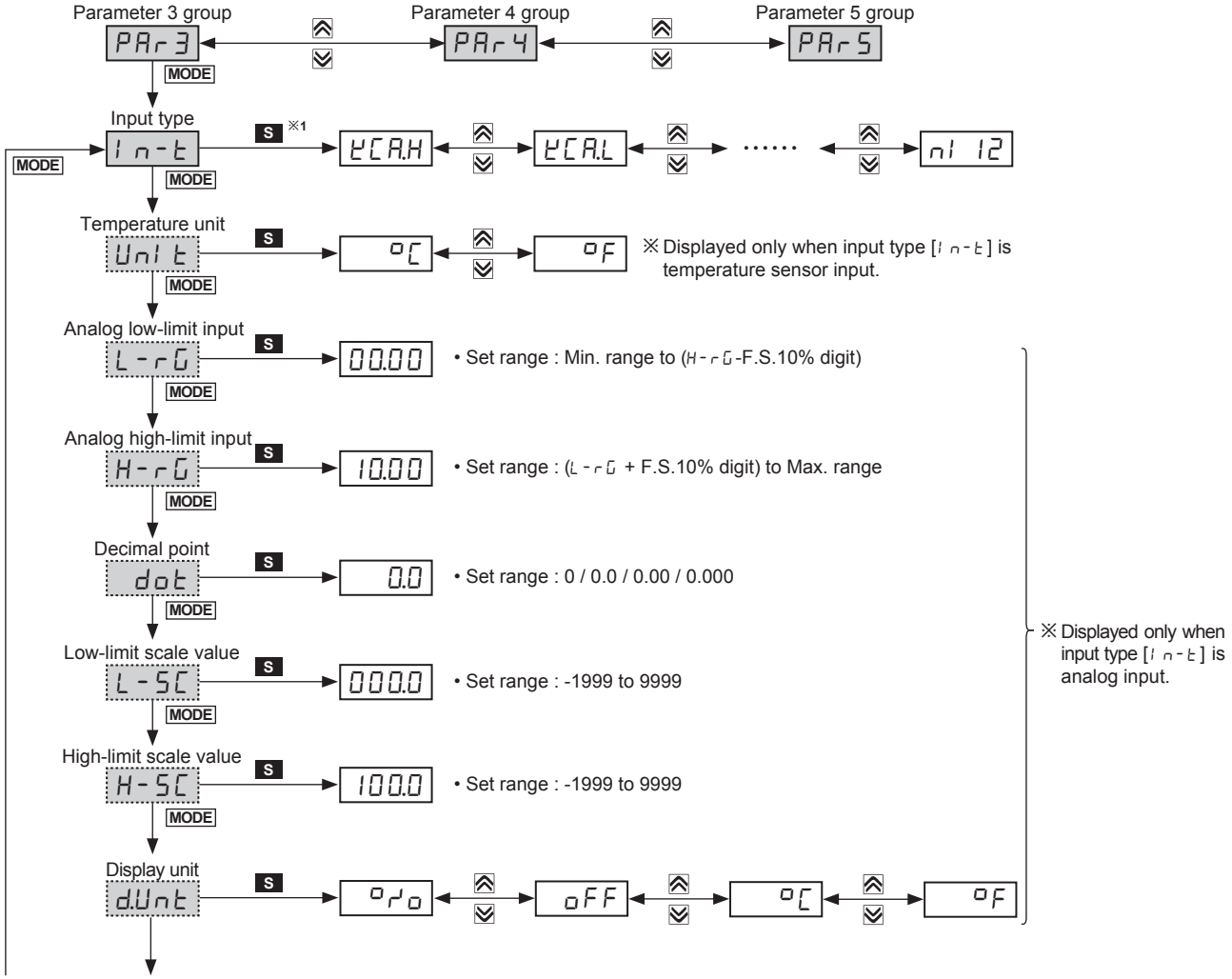
※1: S : Press any key among ≪, ≫, ≪
※After entering setting mode, press MODE key anytime for 3 sec. to return to Run mode.
※After entering setting mode, press MODE key anytime for 1.5 sec. to go to the concerned group name.
※If you press the MODE key after changing the setting value of the parameter the setting value will be stored.
※ Shaded parameters are for standard-level users, the others are for high-level users.
(You can set the user level in parameter 5 group)
※ This parameter might not be displayed depending on other parameter settings.

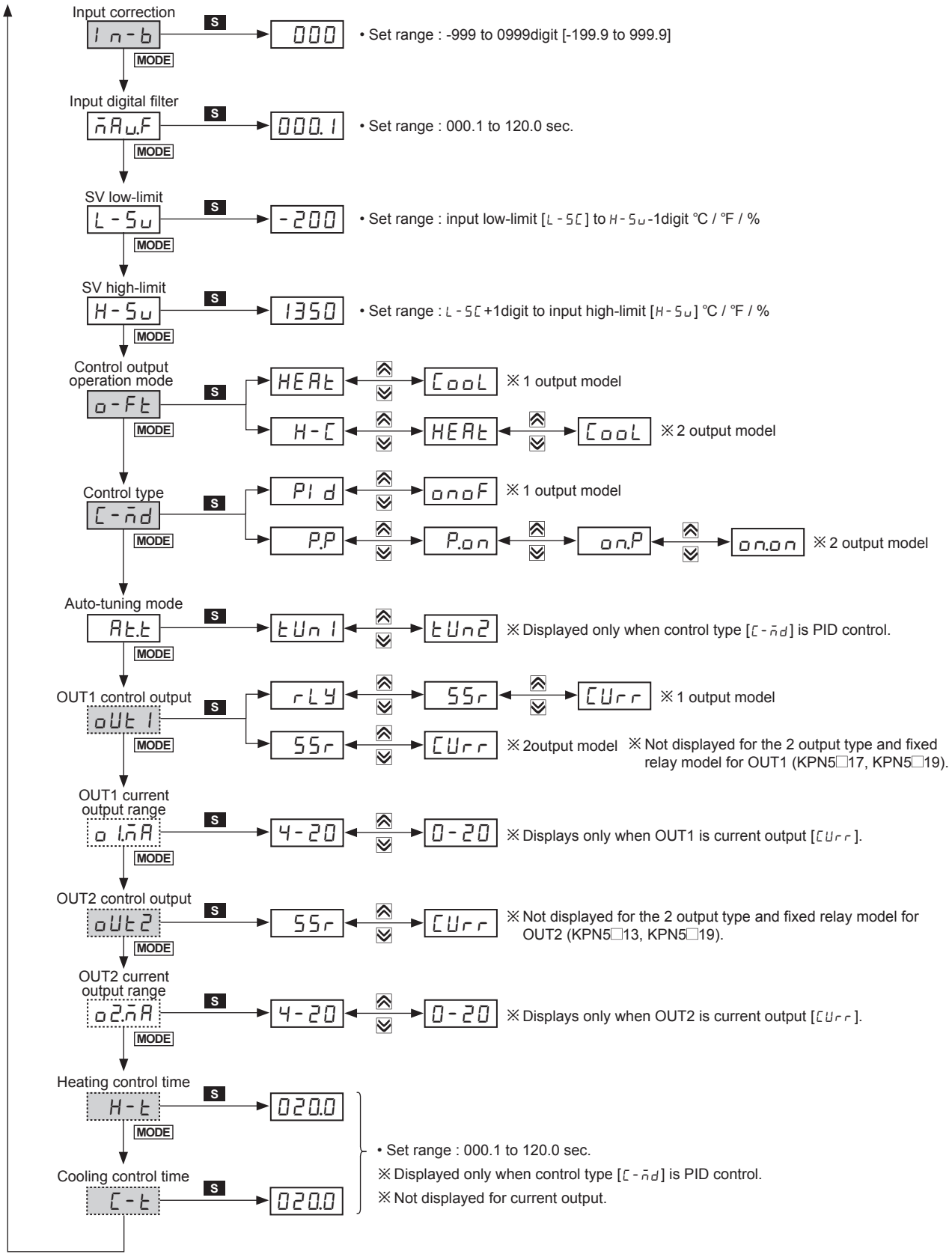




Parameter 3 group

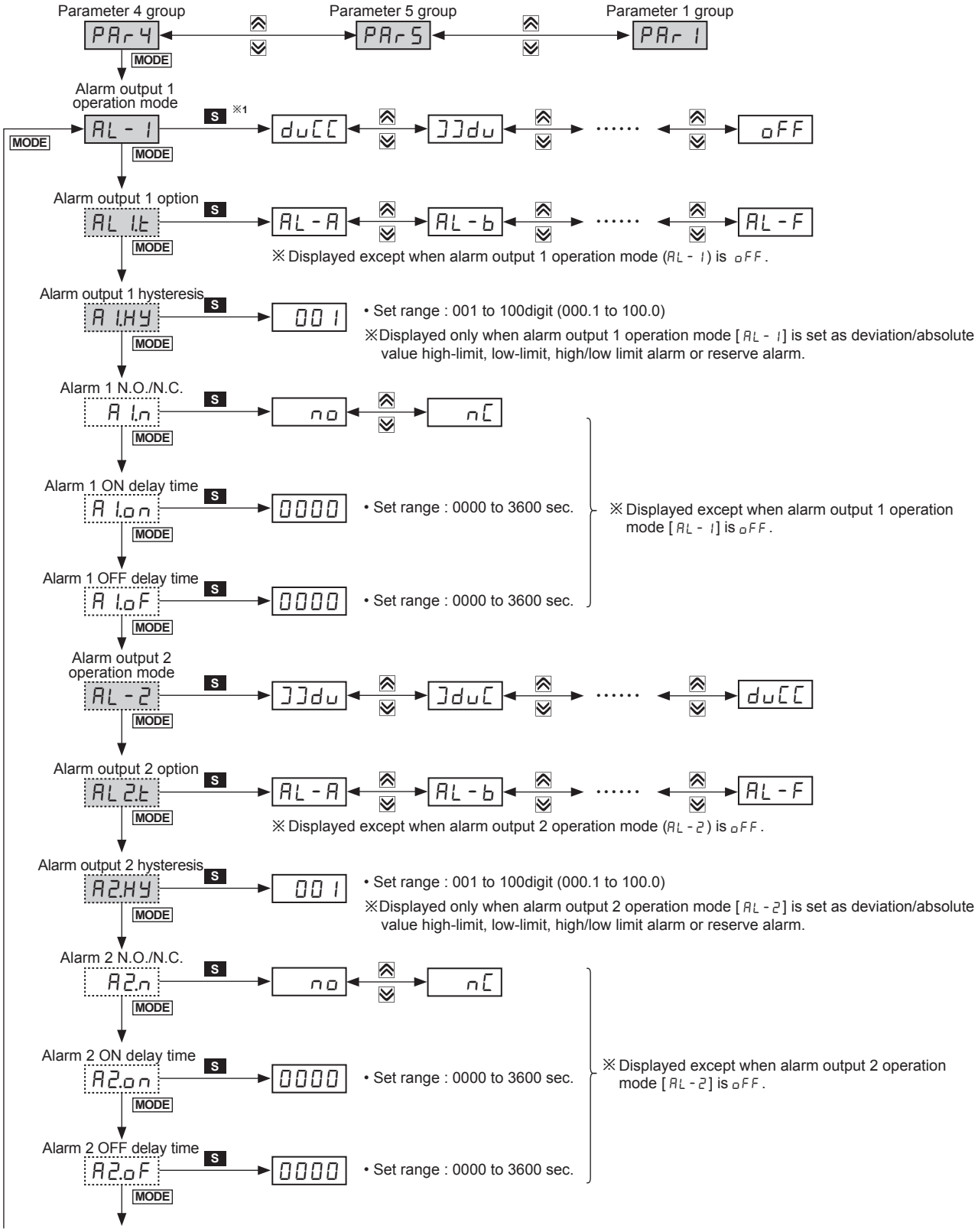
※1: S : Press any key among ≪, ⩒, ⩓
※After entering setting mode, press MODE key anytime for 3 sec. to return to Run mode.
※After entering setting mode, press MODE key anytime for 1.5 sec. to go to the concerned group name.
※If you press the MODE key after changing the setting value of the parameter the setting value will be stored.
※ Shaded parameters are for standard-level users, the others are for high-level users.
(You can set the user level in parameter 5 group)
※ This parameter might not be displayed depending on other parameter settings.

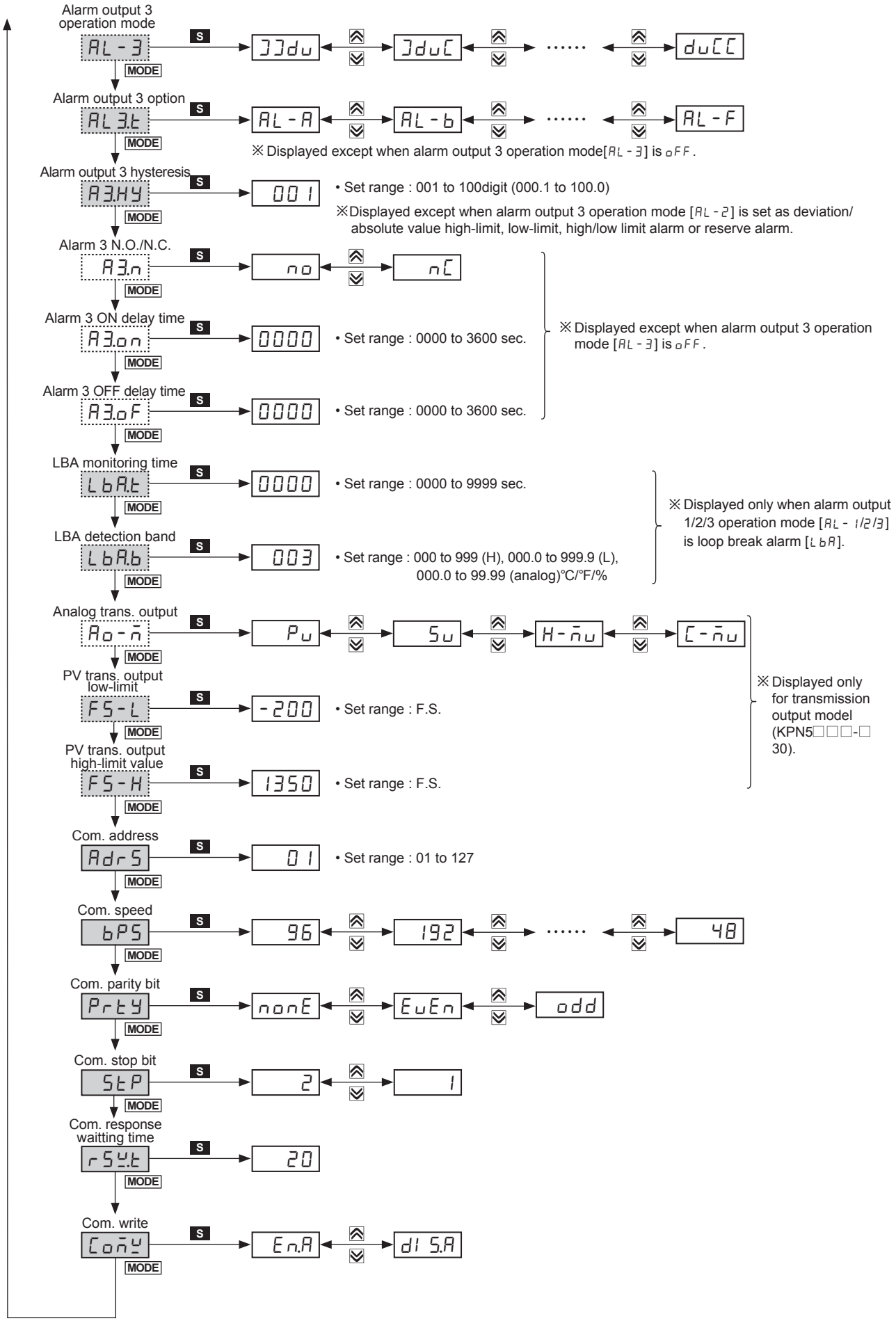



Input correction
In-b
S
000
• Set range : -999 to 0999digit [-199.9 to 999.9]
MODE
Input digital filter
InA.F
S
000.1
• Set range : 000.1 to 120.0 sec.
MODE
SV low-limit
L-SU
S
-200
• Set range : input low-limit [L-SL] to H-SU-1digit ℃ / ℉ / %
MODE
SV high-limit
H-SU
S
1350
• Set range : L-SL+1digit to input high-limit [H-SU] ℃ / ℉ / %
MODE
Control output operation mode
o-Ft
S
HEAt
CooL
※1 output model
H-C
HEAt
CooL
※2 output model
MODE
Control type
C-Ad
S
PId
onoF
※1 output model
P.P
P.on
on.P
on.on
※2 output model
MODE
Auto-tuning mode
At.t
S
tUn1
tUn2
※Displayed only when control type [C-Ad] is PID control.
MODE
OUT1 control output
oUt1
S
rLY
SSr
CUrr
※1 output model
SSr
CUrr
※2output model
※Not displayed for the 2 output type and fixed relay model for OUT1 (KPN5□17, KPN5□19).
MODE
OUT1 current output range
o1.nA
S
4-20
0-20
※Displays only when OUT1 is current output [CUrr].
MODE
OUT2 control output
oUt2
S
SSr
CUrr
※Not displayed for the 2 output type and fixed relay model for OUT2 (KPN5□13, KPN5□19).
MODE
OUT2 current output range
o2.nA
S
4-20
0-20
※Displays only when OUT2 is current output [CUrr].
MODE
Heating control time
H-t
S
020.0
• Set range : 000.1 to 120.0 sec.
※Displayed only when control type [C-Ad] is PID control.
※Not displayed for current output.
MODE
Cooling control time
C-t
S
020.0

Parameter 4 group

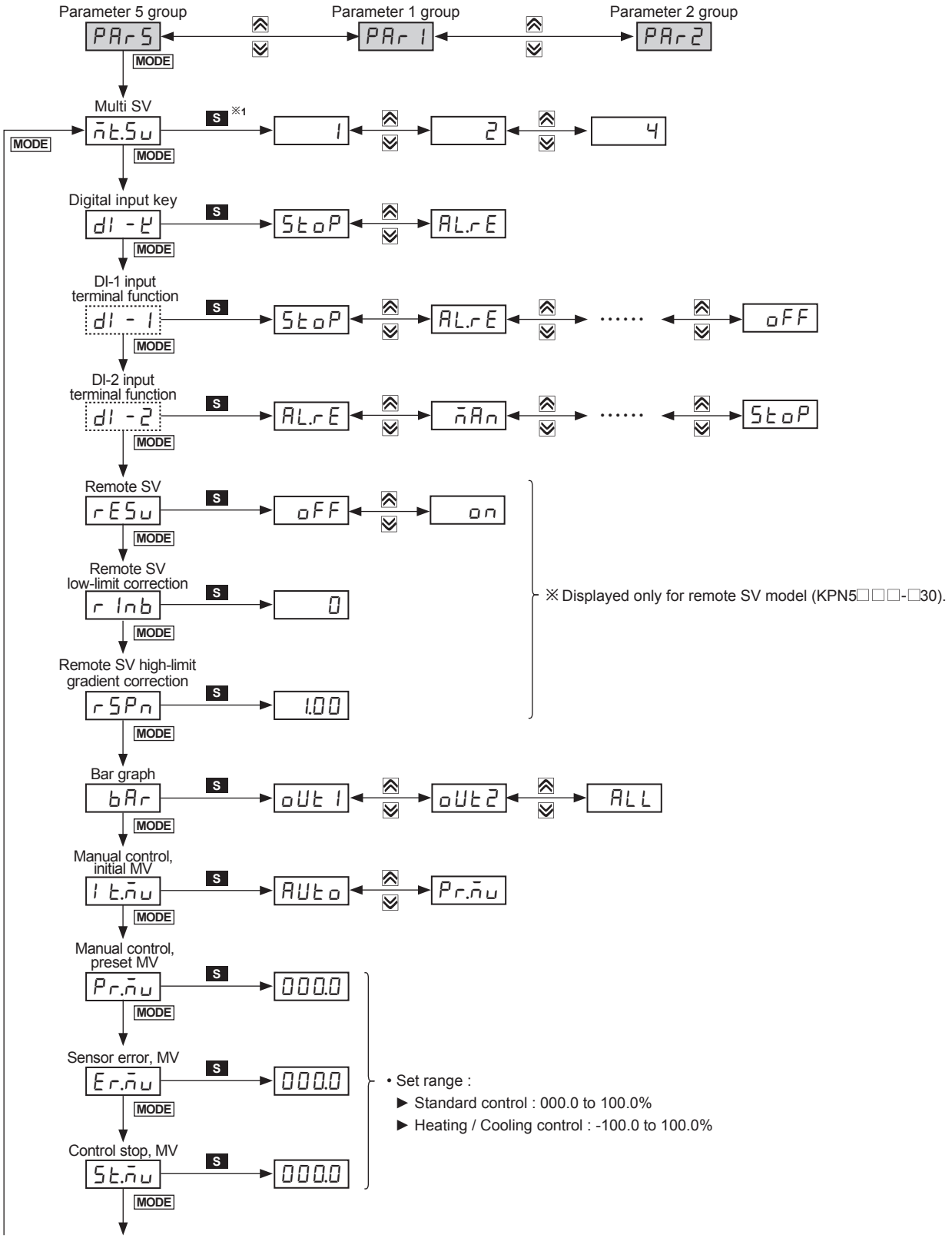
※1: S : Press any key among ≪, ≫, ≫
※After entering setting mode, press MODE key anytime for 3 sec. to return to Run mode.
※After entering setting mode, press MODE key anytime for 1.5 sec. to go to the concerned group name.
※If you press the MODE key after changing the setting value of the parameter the setting value will be stored.
※ Shaded parameters are for standard-level users, the others are for high-level users.
(You can set the user level in parameter 5 group)
※ This parameter might not be displayed depending on other parameter settings.

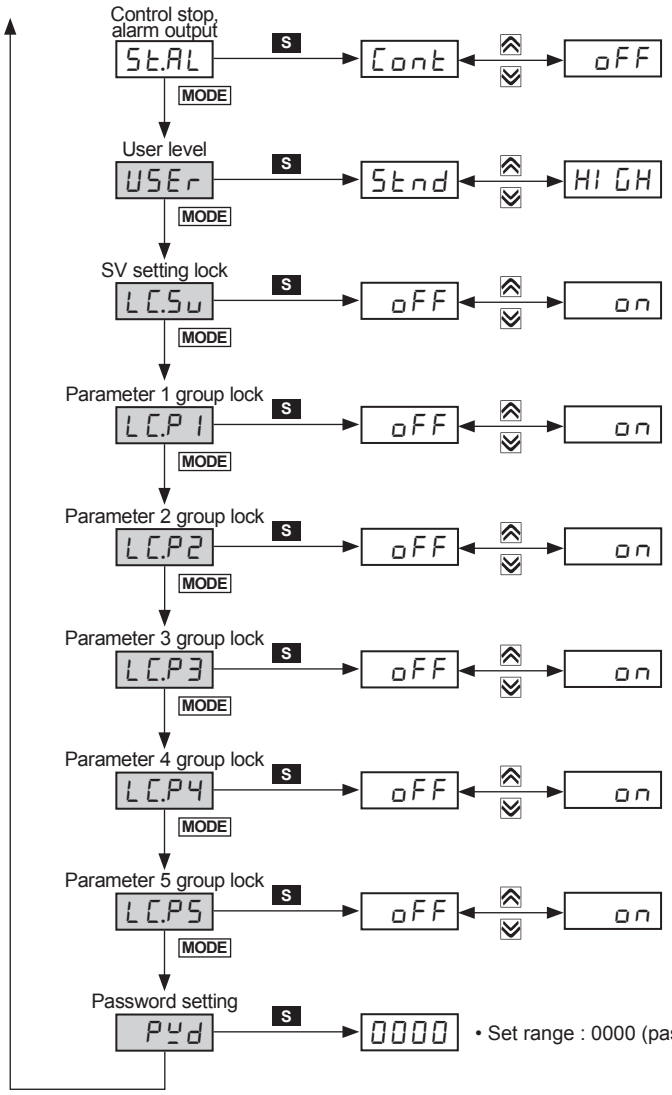



Alarm output 3 operation mode
AL-3
S
MODE
oFF
AL1
AL2
dUCC
Alarm output 3 option
AL3t
AL-A
AL-b
AL-F
※ Displayed except when alarm output 3 operation mode[AL-3] is oFF.
Alarm output 3 hysteresis
A3HY
001
• Set range : 001 to 100digit (000.1 to 100.0)
※Displayed except when alarm output 3 operation mode [AL-2] is set as deviation/ absolute value high-limit, low-limit, high/low limit alarm or reserve alarm.
Alarm 3 N.O./N.C.
A3n
no
nC
Alarm 3 ON delay time
A3on
0000
• Set range : 0000 to 3600 sec.
Alarm 3 OFF delay time
A3oF
0000
• Set range : 0000 to 3600 sec.
※ Displayed except when alarm output 3 operation mode [AL-3] is oFF.
LBA monitoring time
LbAt
0000
• Set range : 0000 to 9999 sec.
LBA detection band
LbAb
003
• Set range : 000 to 999 (H), 000.0 to 999.9 (L), 000.0 to 99.99 (analog)℃/℉/%
※ Displayed only when alarm output 1/2/3 operation mode [AL-1/2/3] is loop break alarm [LbA].
Analog trans. output
Ao-n
Pu
Su
H-nu
C-nu
PV trans. output low-limit
FS-L
-200
• Set range : F.S.
PV trans. output high-limit value
FS-H
1350
• Set range : F.S.
※ Displayed only for transmission output model (KPN5□□□-□ 30).
Com. address
AdrS
01
• Set range : 01 to 127
Com. speed
bPS
96
192
48
Com. parity bit
PrtY
nonE
EuEn
odd
Com. stop bit
StP
2
1
Com. response waitting time
rSYt
20
Com. write
ConY
EnA
diSA

Parameter 5 group

※1: S : Press any key among ≪, ≫, ≪
※After entering setting mode, press MODE key anytime for 3 sec. to return to Run mode.
※After entering setting mode, press MODE key anytime for 1.5 sec. to go to the concerned group name.
※If you press the MODE key after changing the setting value of the parameter the setting value will be stored.
※ Shaded parameters are for standard-level users, the others are for high-level users.
(You can set the user level in parameter 5 group)
※ This parameter might not be displayed depending on other parameter settings.





• Set range : 0000 (password function Off), 0002 to 9999

Factory default

■ SV setting [Su]

Parameter	Default
Su	0

■ Password input parameter

Parameter	Default
PASS	0001

■ Parameter 1 group [PAr 1]

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
r-S	rUn	AL 1.L	1550	AL 3.L	0000	Su-2	0000
Su-n	Su-0	AL 1.H	1550	AL 3.H	0000	Su-3	0000
Ct-A	0.0	AL2.L	1550	Su-0	0000		
AL 1.L	1550	AL2.H	1550	Su-1	0000		

■ Parameter 2 group [PAr 2]

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
At	oFF	H-d	0000	H.oSt	000	rAnU	000
H-P	0 10.0	C-d	0000	C.HYS	002	rAnd	000
C-P	0 10.0	db	0000	C.oSt	000	r.Unt	nI n
H-I	0000	rESt	050.0	L-nu	-100.0		
C-I	0000	H.HYS	002	H-nu	100.0		

■ Parameter 3 group [PAr 3]

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
In-t	tCA.H	H-SC	100.0	o-Ft	HEAt		SSr
Unit	°C	d.Unt	°ro		H-C	o 1.nA	4-20
L-rG	00.00	In-b	0000	C-nd	PId	oUt2	SSr
H-rG	10.00	nAu.F	000.1		P.P	o2.nA	4-20
dot	0.0	L-Su	-200	At.t	tUn1	H-t	020.0 (Relay)
L-SC	000.0	H-Su	1350	oUt1	rLY	C-t	000.0 (SSR drive)

■ Parameter 4 group [PAr 4]

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
AL-1	duCC	AL-2	JJdu	AL-3	LbA	LbA.t	0000	bPS	96
AL 1.t	AL-A	AL2.t	AL-A	AL 3.t	AL-A	LbA.b	002	PrtY	nonE
A 1.HY	001	A2.HY	001	A3.HY	001	Ao.n	Pu	StP	2
A 1.n	no	A2.n	no	A3.n	no	FS.L	-200	rSYt	20
A 1.on	0000	A2.on	0000	A3.on	0000	FS.H	1350	Con Y	En.A
A 1.oF	0000	A2.oF	0000	A3.oF	0000	AdrS	01		

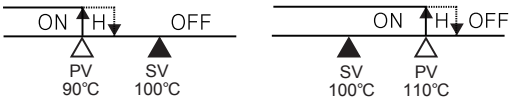
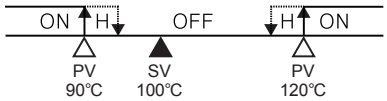
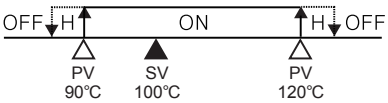
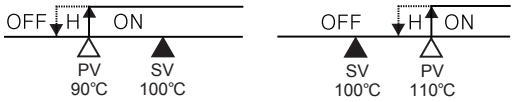
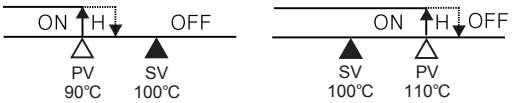
■ Parameter 5 group [PAr 5]

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
nt.Su	1	rSPn	1.000	St.nu	000.0	LC.P3	oFF
dI-U	StoP	bAr	oUt1	St.AL	Cont	LC.P4	oFF
dI-1	oFF		ALL	USEr	Stnd	LC.P5	oFF
dI-2	oFF	It.nu	AUto	LC.Su	oFF	PYd	0000
rE.Su	oFF	Pr.nu	000.0	LC.P1	oFF		
r In.b	0000	Er.nu	000.0	LC.P2	oFF		

※ Shaded parameters are factory defaults for the heating & cooling model.

Functions

■ Alarm operation

Mode	Name	Operation	Description
oFF	—	—	No alarm output
duCC	Deviation high-limit alarm	High deviation : Set as 10℃ High deviation : Set as -10℃	If deviation between PV and SV as high-limit is higher than set value of deviation temperature, the alarm output will be ON.
JJdu	Deviation low-limit alarm	 Low deviation : Set as 10℃ Low deviation : Set as -10℃	If deviation between PV and SV as low-limit is higher than set value of deviation temperature, the alarm output will be ON.
JduC	Deviation high/low-limit alarm	 Low deviation : Set as 10℃ , High deviation : Set as 20℃	If deviation between PV and SV as high/low-limit is higher than set value of deviation temperature, the alarm output will be ON.
[du]	Deviation high/low-limit reserve alarm	 Low deviation : Set as 10℃ , High deviation : Set as 20℃	If deviation between PV and SV as high/low-limit is higher than set value of deviation temperature, the alarm output will be OFF.
PuCC	Absolute value high limit alarm	 Absolute value alarm : Set as 90℃ Absolute value alarm : Set as 110℃	If PV is higher than the absolute value, the output will be ON.
JJPu	Absolute value low limit alarm	 Absolute value alarm : Set as 90℃ Absolute value alarm : Set as 110℃	If PV is lower than the absolute value, the output will be ON.
LbA	Loop break alarm	—	It will be ON when it detects loop break.
SbA	Sensor break alarm	—	It will be ON when it detects sensor disconnection.
HbA	Heater break alarm	—	It will be ON when CT detects heater break.

※H : alarm output □ hysteresis [A□HY]

■ Alarm option

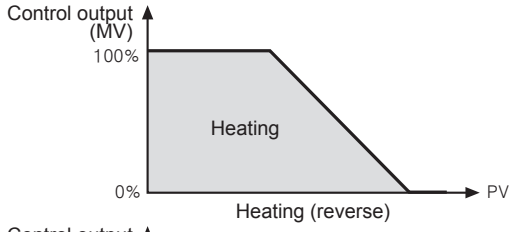
Mode	Name	Description
AL-A	Standard alarm	If it is an alarm condition, alarm output is ON. If it is a clear alarm condition, alarm output is OFF.
AL-b	Alarm latch	If it is an alarm condition, alarm output is ON and maintains ON status.
AL-C	Standby sequence 1	First alarm condition is ignored and from second alarm condition, standard alarm operates. When power is supplied and it is an alarm condition, this first alarm condition is ignored and from the second alarm condition, standard alarm operates.
AL-d	Alarm latch and standby sequence 1	If it is an alarm condition, it operates both alarm latch and standby sequence. When power is supplied and it is an alarm condition, this first alarm condition is ignored and from the second alarm condition, alarm latch operates.
AL-E	Standby sequence 2	First alarm condition is ignored and from second alarm condition, standard alarm operates. When re-applied standby sequence and if it is alarm condition, alarm output does not turn ON. After clearing alarm condition, standard alarm operates.
AL-F	Alarm latch and standby sequence 2	Basic operation is same as alarm latch and standby sequence 1. If it operates not only by power ON/OFF, but also alarm setting value, or alarm option changing. When re-applied standby sequence and if it is alarm condition, alarm output does not turn ON. After clearing alarm condition, alarm latch operates.

※ Condition of re-applied standby sequence for standby sequence 1, alarm latch and standby sequence 1: Power ON

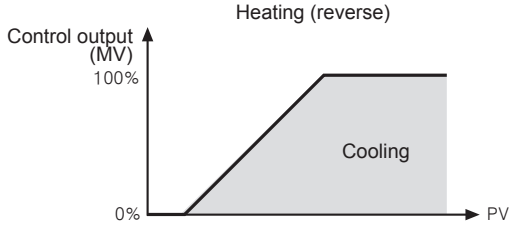
Condition of re-applied standby sequence for standby sequence 2, alarm latch and standby sequence 2: Power ON, changing set temperature, alarm temperature[AL 1, AL2] or alarm operation [AL-1, AL-2]), switching STOP mode to RUN mode.

■ Control output mode [o-Ft]

- Control output modes for general temperature control include heating, cooling, and heating/cooling.
- Heating control (reverse operation) and cooling control (normal operation) are mutually opposing operations with inverse outputs.
- The PID time constant varies based on the controlled objects during PID control.



Heating (reverse)



Cooling (normal)

Group	Parameter	Set range	Default	Unit
PAr3	o-Ft	Standard model HEAt/CooL	HEAt	—
		Heating & Cooling mode HEAt/CooL/H-C	H-C	—

■ Heating control [HEAt]

The output will be provided in order to supply power to the load (heater) if PV(present temperature) falls below SV(set temperature).

■ Cooling control [CooL]

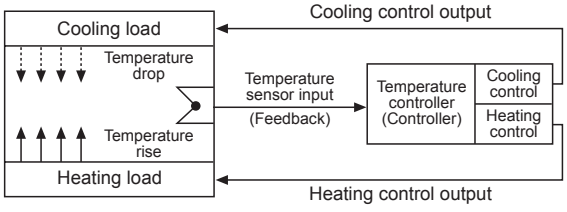
The output will be provided in order to supply power to the load (cooler) if PV(present temperature) rises above SV(set temperature)

■ Heating/Cooling control [H-C]

Heating and Cooling with a single temperature controller when it is difficult to control subject temperature with only heating or cooling.

Heating and cooling control mode controls the object using different PID time constants for each heating and cooling.

It is also possible to set heating and cooling control in both PID control or ON/OFF control mode. Heating/cooling output can be selected among Relay output, SSR output and current output depending on model types chosen according to your application environment. (Note that only standard SSR control is available for SSR output in OUT2.)



※For heating and cooling control, OUT1 control output is dedicated to heating control and OUT2 control output to cooling control.

■ Auto-tuning [At]

In PID control, auto-tuning processes the control subject's thermal characteristics and thermal response rate, and then determines the necessary PID time constant. Application of the PID time constant realizes fast response and high precision temperature control.

- Auto-tuning automatically stores PID time constants upon termination. These PID time constants can then be modified by the user to suit their usage environment.
- When auto-tuning is in progress, the AT lamp located on the front of the controller flashes in 1 second intervals. When auto-tuning finishes, the AT lamp automatically goes off and the auto-tuning parameter will return to OFF.

SV	Description
oFF	Auto-tuning stops
on	Auto-tuning starts

Group	Parameter	Set range	Default	Unit
PAr2	At	oFF/on	oFF	—

※Manual interruption or a sensor break error when auto-tuning is in progress restores the PID time constant to the value used prior to the auto-tuning session.

※Auto-tuning continues to run even if the temperature reading exceeds or falls below the input range.

※When auto-turning is in progress, parameters can only be referenced and not altered.

※Auto-tuning is not available in manual control. (Manual Control).

■ Control output(OUT1/OUT2) selection [oUt1/oUt2]

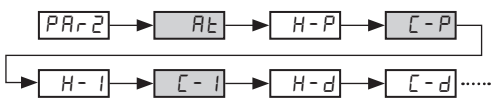
- The 1 output type (OUT1) model supports relay, current, SSR drive voltage output.
- The 2 output type (OUT1, OUT2) model supports relay fixed or current, SSR drive voltage output.

■ Parameter mask

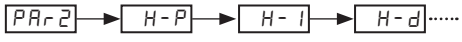
This function is able to hide unnecessary parameters to user environment or less frequently used parameters in parameter setting group. You can set this in the integrated device management program (DAQMaster).

Though masked parameters are not displayed in parameter setting group, the parameter setting values are applied. For more information, refer to the DAQMaster user manual. Visit our website (www.autonics.com) to download the DAQMaster program and the user manual.

<Before applying mask>



<After applying mask>

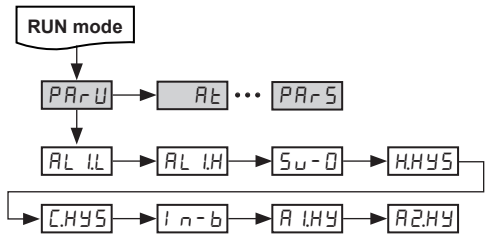


The above is masking auto tuning [At], cooling proportional band [C-P], cooling integral time [C-I], cooling derivative time [C-d] parameters in parameter 2 group.

■ User parameter group [PArU]

This function is able to set the frequently used parameters to the user parameter group.

You can quickly and easily set par Visit our website (www.autonics.com) to download the DAQMaster program and the user manual.



The above is setting user parameter group in the DAQMaster with alarm output 1 low-limit value [AL 1.L], alarm output 1 high-limit value [AL 1.H], SV-0 set value [Su-0] parameters of parameter 1 group, heating hysteresis [H.HY5], cooling hysteresis [C.HY5] parameters of parameter 2 group,

input correction [In-b], parameter of parameter 3 group, alarm output 1 hysteresis [A 1.HY], alarm output 2 hysteresis [A2.HY] parameters of parameter 4 group.

■ Bar graph

MV of control output (OUT1, OUT2) is displayed as the bar graph in real-time. According to bar graph setting [bAr] in parameter 5 group, it displays bar graph by control output or does not display it.

One LED is 10% (total 10 LEDs: 100%). If control output MV is 0.1 to 10%, one LED turns ON. If MV is 90.1 to 100%, 10 LEDs turn ON.

The 1 output type (heating or cooling control) model has one OUT1 bar graph (red).

The 2 output type (heating & cooling control) model has two bar graphs; OUT1 bar graph (red), OUT2 bar graph (green). OUT1 is for heating MV and OUT2 is for cooling MV.

■ Remote SV setting

This function is to set SV by inputting analog (DC4-20 mA, 1-5 VDC) signal to no. 13 and 14 terminals. (Set that remote SV [rE.Su] is ON in parameter 5 group)

Input analog signal is changed to between SV low-limit value [L-Su] to SV high-limit value [H-Su].

※When using remote SV, you cannot select SV setting by front keys and multi SV setting by digital input.

■ Parameter initialization

It initializes all parameters to factory default values. Press the front ◁+▽+△ keys for 5 sec. at the same time and [Init] parameter is displayed. Select 'YES' to initialize all parameters.

If the password is set, you must enter the password. After initialing the parameters, the password parameter is also initialized.

※ ■ **Refer to the KPN user manual for more functions.**

Proper usage

■ Simple troubleshooting for process controller

● When the load (Heater etc) is not operated

Please check operation of the out indicator located in front panel of the unit. If the indicator does not operate, please check the parameter of all programmed mode. If the indicator is operating, please check the output (Relay, SSR drive voltage, DC4-20 mA current) after separating output line from the unit.

● When it displays oPEn during operation

This is a warning that external sensor is cut off (open).

Please turn off power and check the state of sensor. If sensor is not cut off (open), disconnect sensor line from terminal block and +, - together. When you turn on power it can check room temperature.

If this unit cannot indicate room temperature, this unit itself is faulty. Please remove this unit from equipment and service or replace.

(When the input mode is thermocouple, it is available to indicate room temperature.)

● In case of indicating "Error" in display

This Error message is indicated in case of damaging inner chip program data by outer strong noise.

In this case, please send the unit to our after service center after removing the unit from system.

Noise protection is designed in this unit, but it does not stand up strong noise continuously.

If bigger noise than specified(Max. 2 kV) flows in the unit, it can be damaged.

■ Caution for using

- The connection of this unit should be separated from the power line and high voltage line in order to prevent inductive noise.
- Install a power switch or a circuit breaker to supply or cut off the power.
- Switch or circuit breaker should be installed nearby users for convenient control.
- This unit is designed for temperature controlling only. Do not apply this unit as a voltage meter or a current meter.
- In case of using RTD sensor, 3-wire type must be used. If you need to extend the line, use 3-wire with the same thickness as the line. It might cause temperature difference if the resistance of line is different.
- In case of making power line and input signal line closely, line filter for noise protection should be installed at power line and input signal line should be shielded.
- Do not use this unit near the high frequency instruments (high frequency welding machine & sewing machine, large capacity SCR controller).
- Installation environment
  ① It shall be used indoors.
  ② Altitude max. 2,000 m
  ③ Pollution degree 2
  ④ Installation category II
- It may cause malfunction if above instructions are not followed.